

Date: Friday, 12/09/2008 9:00:19 AM  
 User: Julie Lecocq

## Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services		Drawing Name	: HIGH AFT X-TUBE 412		
Job Number	: 41998			Part Number	: D412664203TRN	
Estimate Number	: 13210			Drawing Number	: D412-664-243 REV D	
P.O. Number	:			Project Number	: N/A	
This Issue	: 12/09/2008		S.O. No. :	Drawing Revision	: D	
Prsht Rev.	: NC			Material	:	
First Issue	: / /		Type :	CROSSTUBES	Due Date	: 19/09/2008
Previous Run	: 41997			Qty:	1	Um: Each
Written By	:					
Checked & Approved By	: <u>JUL 08.9.12</u>					
Comment	: Est Rev:A 08-03-06 new issue DD verified by:ec Est Rev B 08.04.02 Removed polish EC verified by: DD					

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :	
1.0	D6009129	Crosstube Material	
		Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s) Pick: Qty Part number Description Batch 1 D6009-129 Crosstube <u>332306</u> Check OD = 3.500"; ID = 2.250"	<u>A.m 08.09.22.0</u>
2.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE	
		Comment: Setup: 0.00Hrs/ Run: 0.0000Min Total Run : 0.0000Hrs MORI SEIKI CNC LATHE LARGE	
		1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA166	
		2-Turn first side as per Folio FA166	
		3- File transition lines smooth.	<u>A.m 08.09.22.0</u>
3.0	QC1	INSPECT ALL DIM TO DIM SHEET	
		Comment: Setup: 0.00Hrs/ Run: 0.0000Hrs Total Run : 0.0000Hrs INSPECT ALL DIM TO DIM SHEET	<u>a.m 08.09.22.0</u>
4.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE	
		Comment: Setup: 0.00Hrs/ Run: 0.0000Min Total Run : 0.0000Hrs MORI SEIKI CNC LATHE LARGE	<u>a.m 08.09.22.0</u>
		1-Turn second side as per Folio FA166	<u>A.m 08.09.22.0</u>

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Friday, 12/09/2008 9:00:19 AM  
User: Julie Lecocq

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: HIGH AFT X-TUBE 412

Job Number: 41998

Part Number: D412664203TRN

Job Number:



Seq. #:

Machine Or Operation:

Description :

2- File transition lines smooth.

3- Remove sand and plugs

4-Scribe part # and batch # using vibrating stylus as per Dwg D412-664-243  
engrave on outside of tube)

Inside of Cuff(Donot

8-08-09-220

5.0 QC1

INSPECT ALL DIM TO DIM SHEET



Comment: Setup: 0.00Hrs/ Run: 0.0000Hrs Total Run : 0.0000Hrs

INSPECT ALL DIM TO DIM SHEET

8-08-09-220

6.0 QC8

SECOND CHECK



AWM 8-9-23



Comment: Setup: 0.00Hrs/ Run: 0.0000Hrs Total Run : 0.0000Hrs

SECOND CHECK

7.0 HAND FINISHING1

HAND FINISHING RESOURCE #1



AWM 8-9-23



Comment: Setup: 0.00Hrs/ Run: 0.0000Min Total Run : 0.0000Hrs

HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

8.0 QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: Setup: 0.00Hrs/ Run: 0.0000Hrs Total Run : 0.0000Hrs

INSPECT POWDER COAT/CHEMICAL CONVERSION

① 8-9-23

9.0 PACKAGING 1

PACKAGING RESOURCE #1



Comment: Setup: 0.00Hrs/ Run: 0.0000Min Total Run : 0.0000Hrs

PACKAGING RESOURCE #1

Identify and stock in kanban rack

Location: X-TUBE CCC AWM 8-9-23

10.0 QC21

FINAL INSPECTION/W/O RELEASE



08/09/24/09

Comment: Setup: 0.00Hrs/ Run: 0.0000Hrs Total Run : 0.0000Hrs

FINAL INSPECTION/W/O RELEASE

Job Completion



W 08/09/24/09

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order: <u>4998</u>
Description: Crosstube Assembly (412 High Aft)	Part Number: D412-664-243
Inspection Dwg: D412-664-243 Rev: D	Page 1 of 1

### FIRST ARTICLE INSPECTION CHECKLIST

First Article  Prototype

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.684	+0.005/-0.000	<u>2.689</u>	/		
	2.748	+0.005/-0.000	<u>2.748</u>	/		
	2.884	+0.005/-0.000	<u>2.884</u>	/		
	3.019	+0.005/-0.000	<u>3.019</u>	/		
	3.163	+0.005/-0.000	<u>3.163</u>	/		
	3.308	+0.005/-0.000	<u>3.308</u>	/		
	3.429	+0.005/-0.000	<u>3.430</u>	/		
	2.990	+0.005/-0.000	<u>2.993</u>	/		
	2.618	+0.005/-0.000	<u>2.618</u>	/		
	0.200	+/-0.010	<u>0.200</u>	/		
	R0.063	+/-0.010	<u>R0.063</u>	/		
	R0.500	+/-0.010	<u>R0.500</u>	/		
	4.971	+/-0.030	<u>4.971</u>	/		
SIDE B	2.684	+0.005/-0.000	<u>2.684</u>	/		
	2.748	+0.005/-0.000	<u>2.748</u>	/		
	2.884	+0.005/-0.000	<u>2.884</u>	/		
	3.019	+0.005/-0.000	<u>3.019</u>	/		
	3.163	+0.005/-0.000	<u>3.163</u>	/		
	3.308	+0.005/-0.000	<u>3.308</u>	/		
	3.429	+0.005/-0.000	<u>3.430</u>	/		
	2.990	+0.005/-0.000	<u>2.992</u>	/		
	2.618	+0.005/-0.000	<u>2.608</u>	/		
	0.200	+/-0.010	<u>0.200</u>	/		
	R0.063	+/-0.010	<u>R0.063</u>	/		
	R0.500	+/-0.010	<u>R0.500</u>	/		
	4.971	+/-0.030	<u>4.971</u>	/		
	124.09	+/-0.020	<u>124.090</u>	/		

Measured by:	<u>Q.m</u>	Audited by:	<u>AWM</u>	Prototype Approval:	N/A
Date:	<u>08.04.22</u>	Date:	<u>8-7-23</u>	Date:	<u>N/A</u>

Rev	Date	Change	Revised by	Approved
A	04.06.16	New Issue (P/O D412-664-203)	KJ/JLM	
B	06.03.09	Dwg Rev updated	KJ/JLM	
C	07.05.08	Tolerance updated for dimension 4.971	KJ/JLM <u>✓</u>	<u>DA</u>

**DART**

DESIGN <i>PH</i>	DRAWN BY <i>PH</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>GP</i>	APPROVED <i>off</i>	DRAWING NO. D412-664-243	REV. D SHEET 1 OF 3
DATE 07.03.09		TITLE CROSSTUBE ASSEMBLY (412 HI AFT) NTS	
A	01.10.17	SCALE NEW ISSUE	
B	05.02.04	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	
C	06.10.27	REMOVE D2856-600-1087, ADD D2732-058 & MAGNOBOND 6398 MS21920-32 WAS MS21920-30	
D	07.03.09	REMOVE D2732-058, CHANGE TO D3595-063-570	

**RELEASED**07.04.24 *#*

Qty	Part Number	Description
X	D412-664-243	CROSSTUBE ASSEMBLY (412 HIGH AFT)
1	D6009-129	CROSSTUBE
2	D3595-063-570	RUBBER CUSHION
1	D2896-1	SUPPORT
2	D2856-600-1009	ABRASION STRIP
4	MS21920-28	CLAMP
2	MS21920-30	CLAMP (OR MS21920-32)
2	D3189-1	CHAFING SHIELD
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

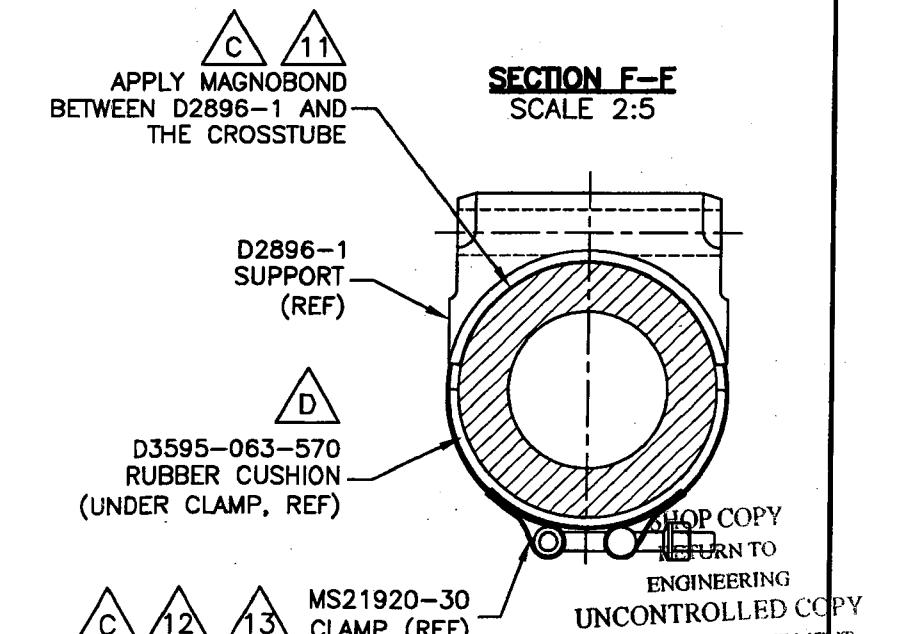
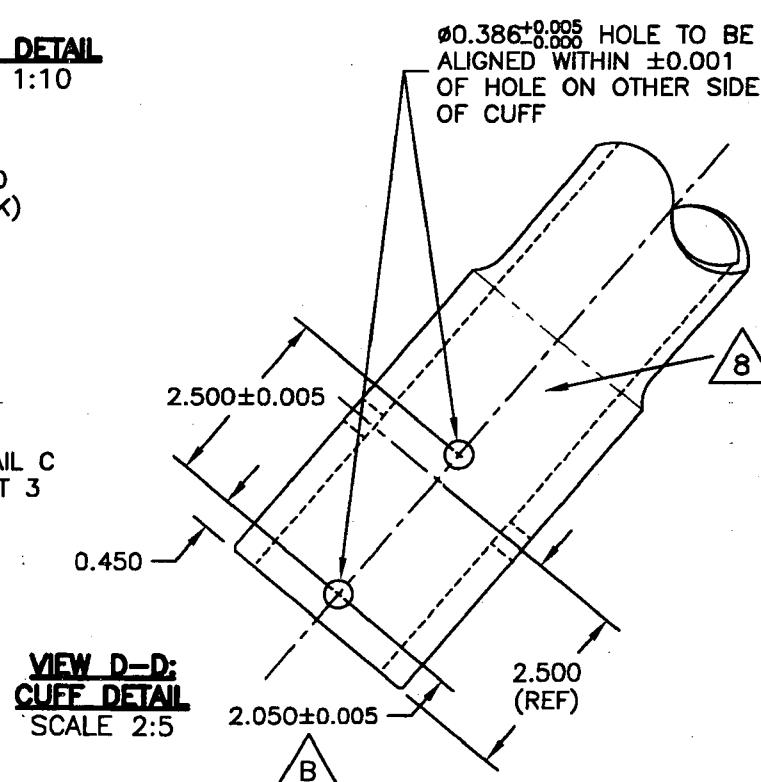
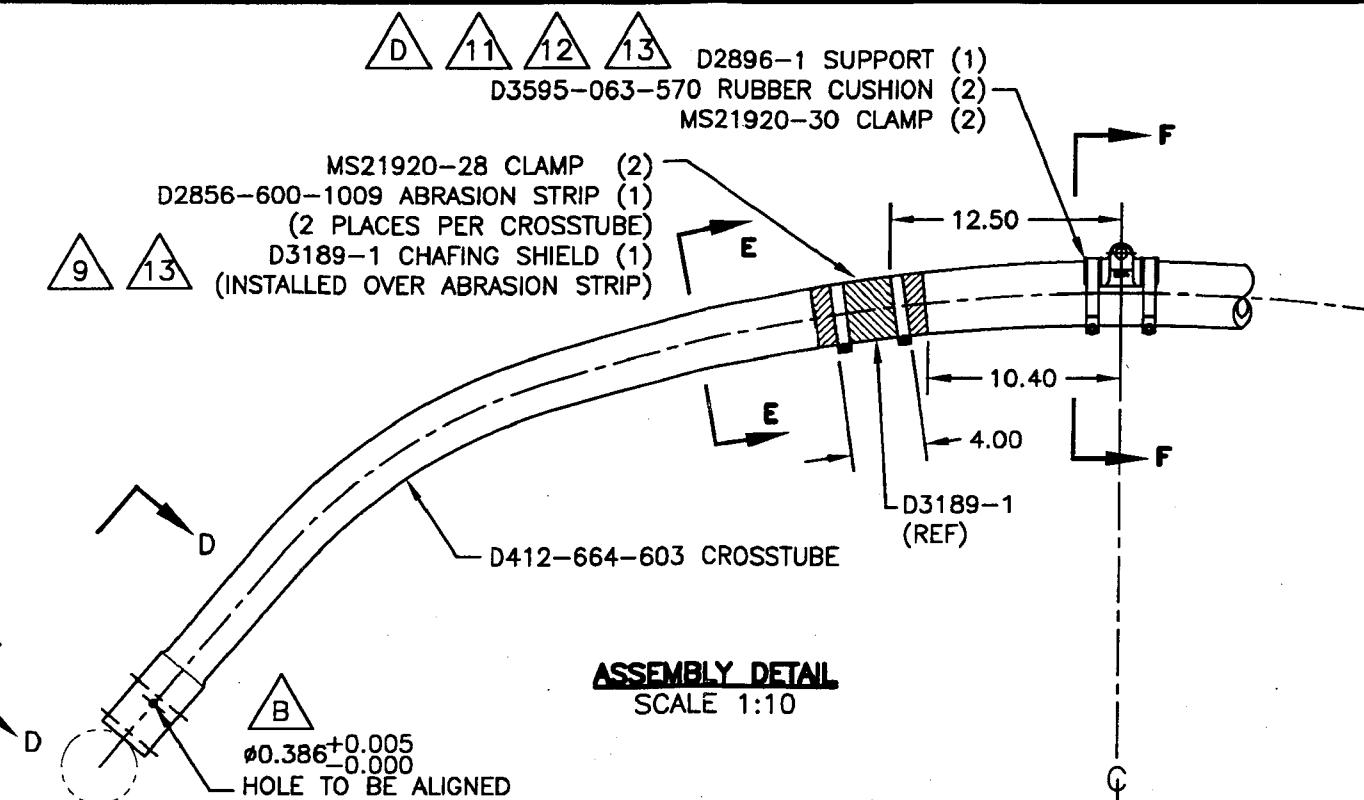
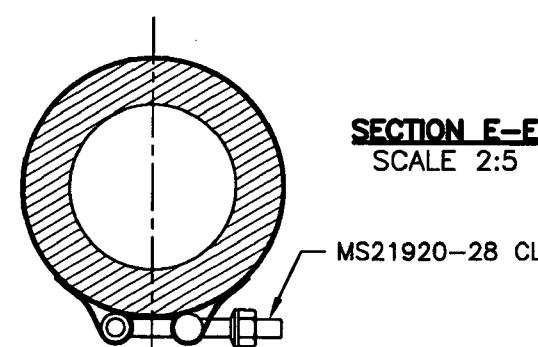
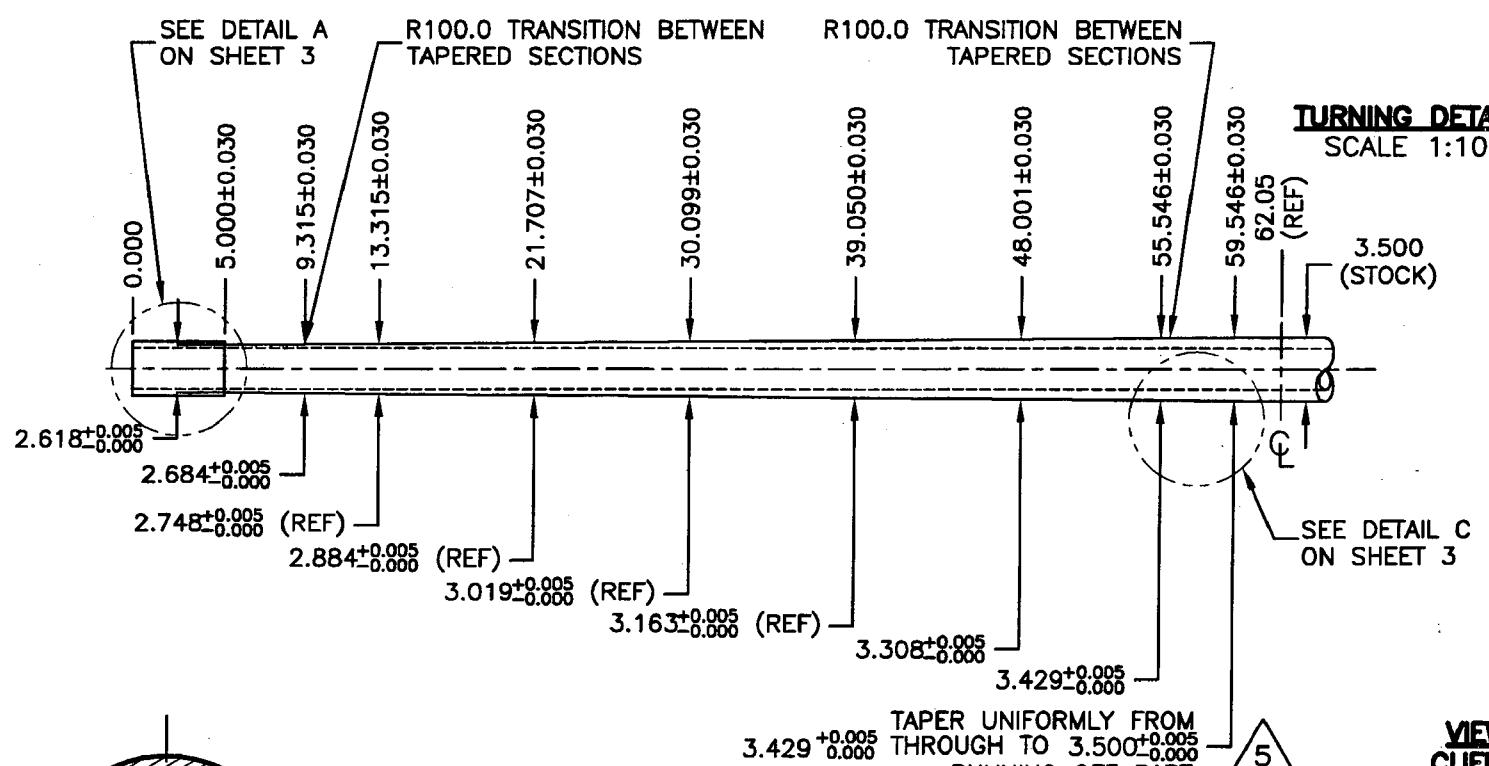
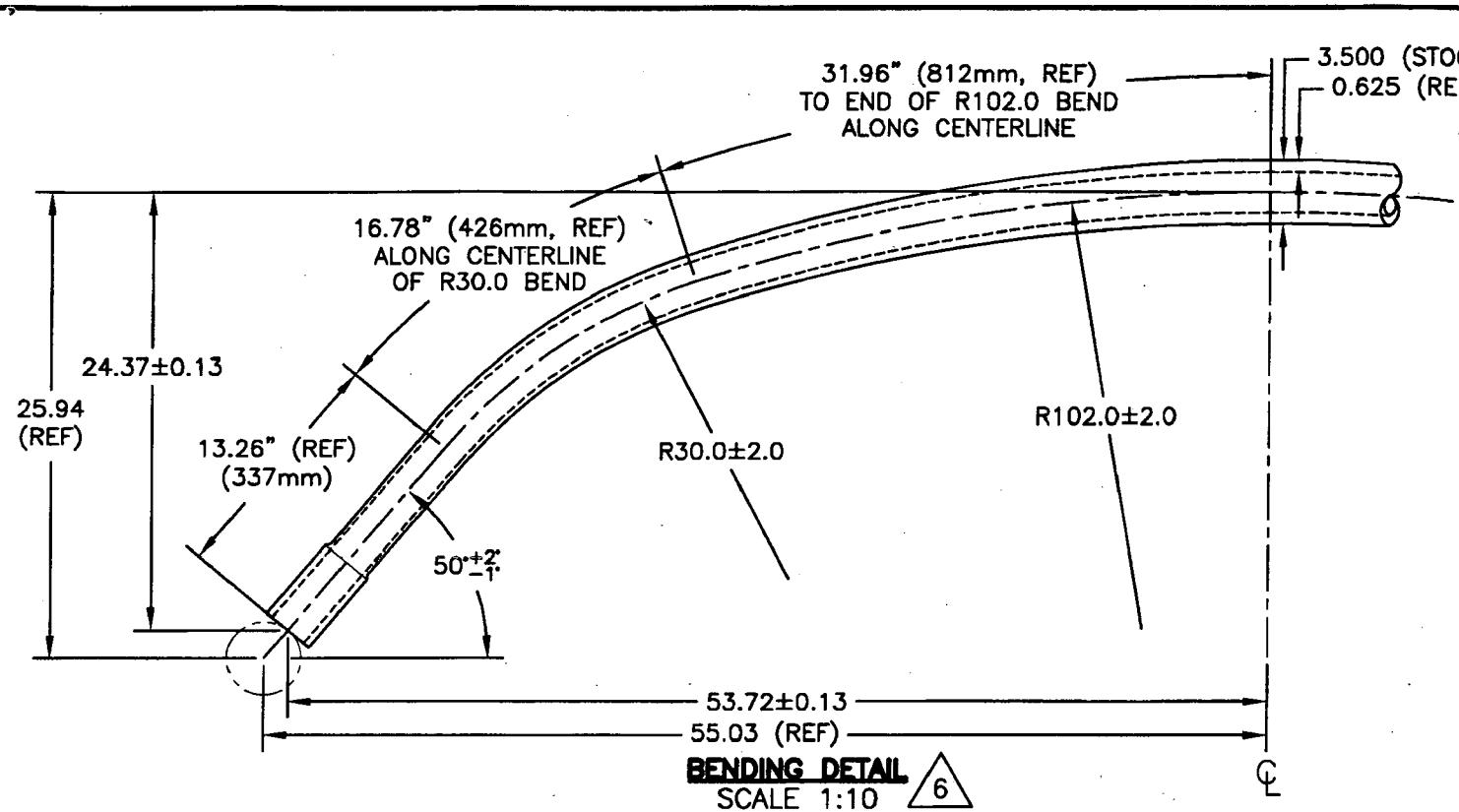
**GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6009-129  
FINISHED LENGTH =  $124.09 \pm 0.020$
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-600-1009 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

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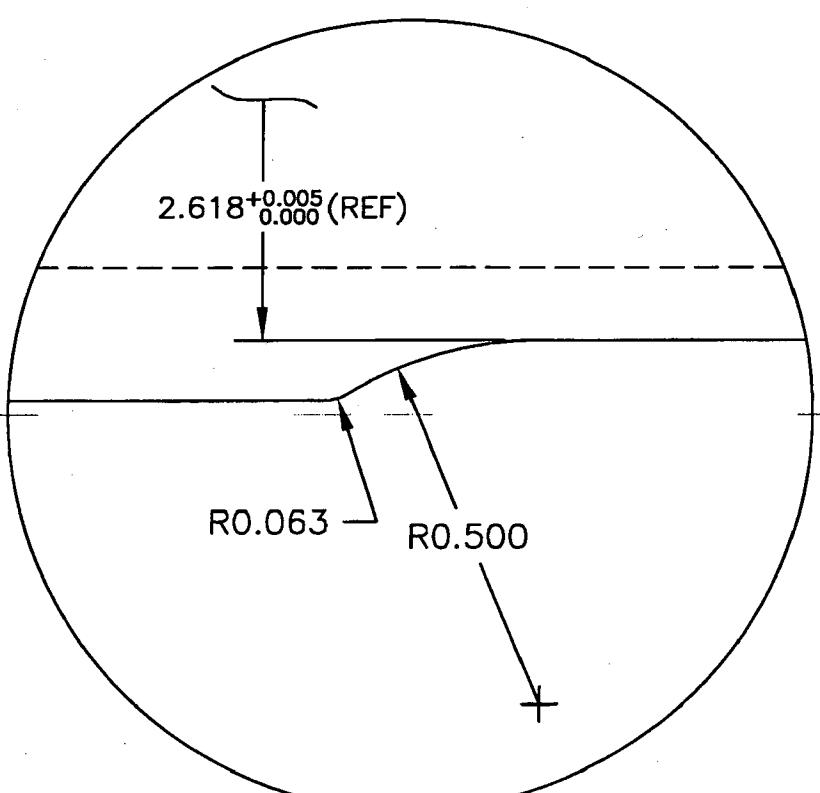
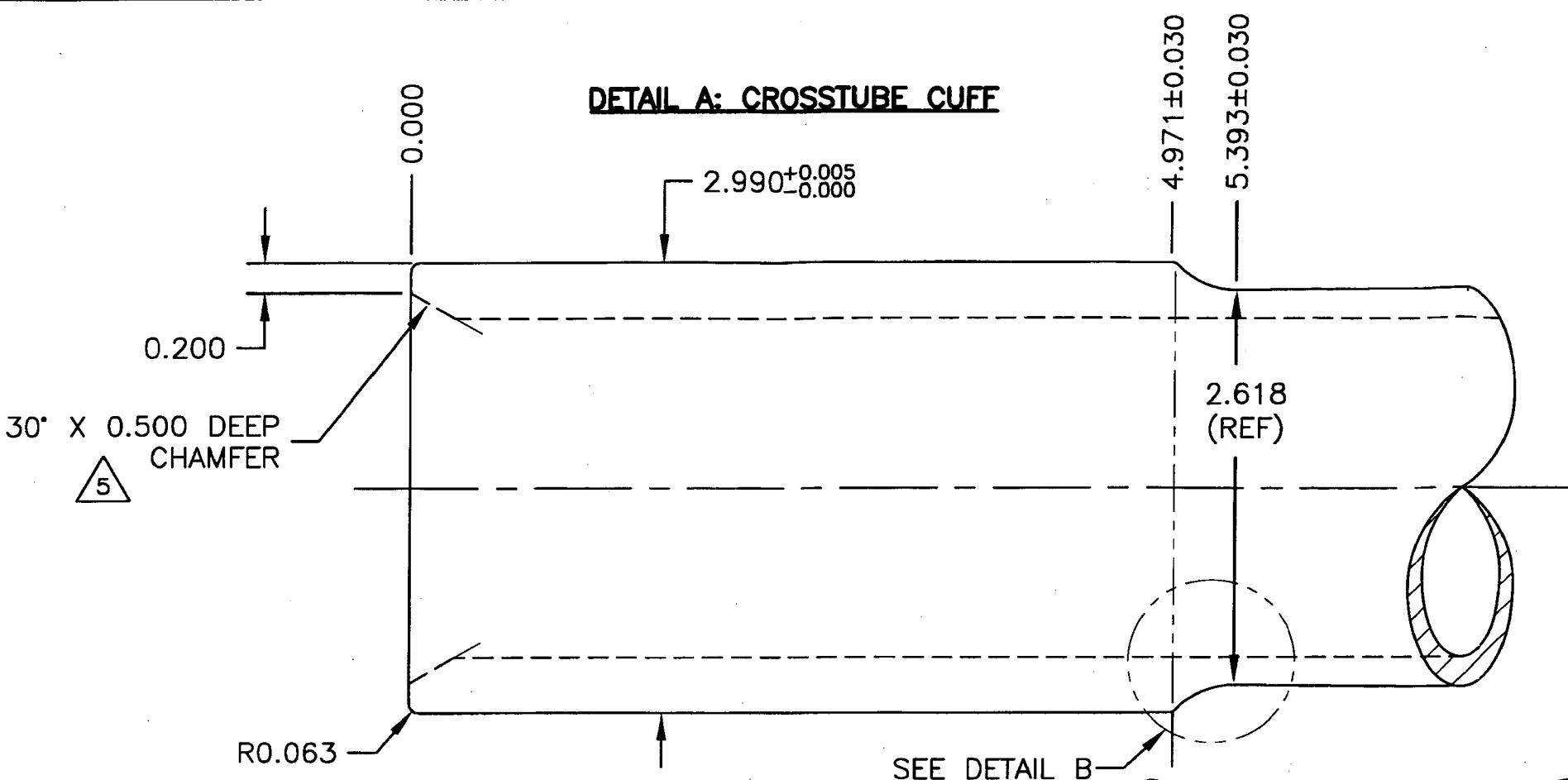


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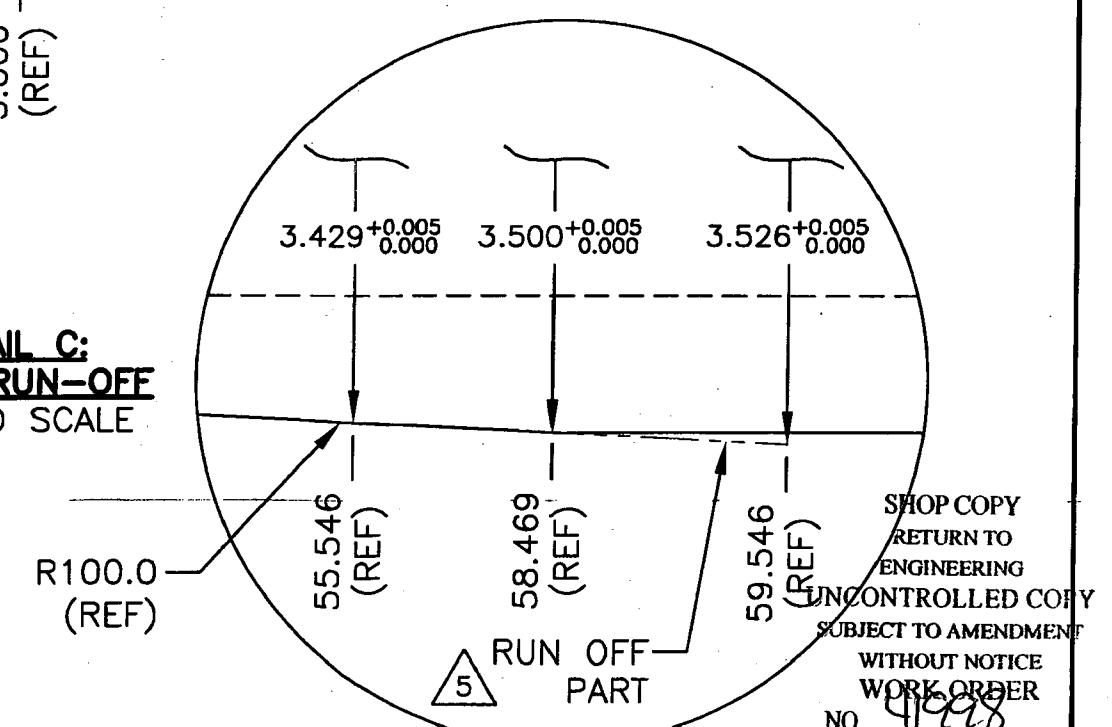
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PH	PH		NO. 11713
CHECKED	APPROVED		REV. D
9P	H	DRAWING NO. D412-664-243	SHEET 2 OF 3
DATE		TITLE	SCALE 1:10
07.03.09		CROSSTUBE ASSEMBLY (412 HI AFT)	

RELEASED  
07.04.2449  
PER ECN 897



**DETAIL C:  
TAPER RUN-OFF**  
NOT TO SCALE



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PH	PH	DART	REV. D
CHECKED	APPROVED	DRAWING NO.	SHEET 3 OF 3
		D412-664-243	1:1
DATE		TITLE	SCALE
07.03.09		CROSSTUBE ASSEMBLY (412 HI AFT)	

